Bibliography on Chernobyl Radioactivity Impacts and Remediation of Forest Ecosystems

by

Colin D. Rennie and Anar S. Baweja
Surveys and Information Systems
Environment Canada
Ottawa, Ontario

June 1992

TABLE OF CONTENTS

		page
A.	General References Concerning Chernobyl Nuclear Accident	1
B.	Remediation Technologies at Bikini Atoll Islands	5

A. General References Concerning Chernobyl Nuclear Accident

The selected references contained in this section pertain to radiological source terms from the Chernobyl accident, distribution of radioactivity, transport of radionuclides in aquatic and terrestrial ecosystems, biological impacts/indicators, etc.

AECL - WRNE. 1988. Effect of Soil Type on Radionuclides in Plants: Field Study. Environmental Research Branch, AECL-WRNE. Atomic Energy Control Board INFO-0290.

Arthur, W.J. 1982. Radionuclide Concentrations in Vegetation at a Solid Radioactive Waste Disposal Area in Southwestern Idaho. J of Environmental Quality, 11(3):394-399.

Bocock, K.L. 1981. *Radionuclides in Terrestrial Ecosystems: A Review of their Distribution and Movement*. Natural Environment Research Council, Institute of Terrestrial Ecology, Cambridge.

Boyd, T.E., R.L. Kochen, and M.Y. Price. 1982. Removal of Radioactive Materials from Waste Solutions via Magnetic Ferrites. In "Ans/Doe Treatment & Handling of Radioactive Wastes Battelle/Springer-Verlag Conf, Richland, WA, Apr 19-22, 82", pp381-384.

Bunzl, K., and W. Schimmack. 1989. Interception and Retention of Chernobyl-Derived ^{134}Cs, ^{137}Cs and ^{106}Ru in a Spruce Stand. Science of the Total Environment, 78:77-87.

Carlsen, L. 1985. Radionuclide-Soil Organic Matter Interactions (Final Report Part 1). European Applied Research Reports, 6(6):1419-1476.

Cataldo, D.A. and B.E. Vaughan. 1980. Transuranic Elements in the Environment (Interaction of Airborne Plutonium with Plant Foliage). DOE Report Doe/Tic-22800, pp288-298.

Chilton, B.D., and H.A. Pfuderer. 1989. Overview of Cleanup and Treatment of Radioactively Contaminated Sites. Nuclear Safety, 30(4):519-533.

Coughtrey, P.J., D. Jackson, and M.C. Thorne. 1983. Radionuclide Distribution and Transport in Terrestrial and Aquatic Ecosystems, Volumes 1-3. CEC (a. a. Balkema Report, gov. report.

Davidson, C.I., J.R. Harrington, M.J. Stephenson, M.C. Monaghan, J. Pudykiewicz, and W.R. Schell. 1987. Radioactive Cesium from the Chernobyl Accident in the Greenland Ice Sheet. Science, 237:633-634.

Derry, R.D. 1990. *A Concise World Atlas of Geology and Mineral Deposits*. Mining Journal Books, London.
Earth Sciences Dept., Univ. of Waterloo. 1981. Column Studies of Strontium and Cesium Migration in a Granular Geologic Material. Prepared for Atomic Energy Control Board, Ottawa, #INFO-0050.

Earth Sciences Dept., Univ. of Waterloo. 1981. Studies of Cesium and Strontium in Unconsolidated Canadian Geological Materials. Prepared for Atomic Energy Control Board, Ottawa, #INFO-0049.

Foster, G.R., and T.E. Hakonson. 1984. Predicted Erosion and Sediment Delivery of Fallout Plutonium. J of Environmental Quality, 13(4):595-602.

Francis, C.W. 1973. Review of Plutonium Mobility in Soil & Plant Uptake. J of Environmental Quality, 2(1):67-70.

Grant, D.C., M.C. Skriba, and A.K. Saha. 1987. Removal of Radioactive Contaminants from West Valley Waste Streams Using Natural Zeolites. Environmental Progress, 6(2):104-109.

Heath, M.J., and E.M. Durrance. 1985. Radionuclide Migration in Fractured Rock: Hydrological Investigations at and Experimental Site in the Carnmennellis Granite, Cornwall. CEC Report Eur 9668 EN, gov report.

International Advisory Committee. 1991. *The International Chernobyl Project: Assessment of Radiological Consequences and Evaluation of Protective Measures, Technical Report*. International Atomic Energy Agency, Vienna. *An Overview, Proceedings of an International Conference,* and *Contamination Maps* are all also available.

Inter Technologies Ltd. 1992. An Evaluation of Contaminant Retardation Mechanisms. Report prepared for Atomic Energy Control Board, Ottawa, #INFO-0406.

Jackson, D., and A.D. Smith. 1989. Uptake and Retention of Strontium, Iodine and Caesium in Lowland Pasture Following Continuous or Short-Term Deposition. Science of the Total Environment, 85(Sep):63-72.

Joshi, S.R. 1987. Early Canadian Results on the Long-Range Transport of Chernobyl Radioactivity. The Science of the Total Environment, 63:125-137.

Kathren, R.L. 1984. *Radioactivity in the Environment: Sources, Distribution, and Surveillance*. Harwood Academic Publishers, New York.

Kim, K.H., S.Y. Lee, and J.T. Ammons. 1990. Immobilization of Radioactive Strontium in Contaminated Soils by Phosphate Treatment. In "Materials Research Soc Scientific Basis for Nuclear Waste Management XIV Sym, Boston, MA, Nov 26-Dec 1, 90", pp633-640.

Leppert, D. 1990. Heavy Metal Sorption with clinoptilolite Zeolite: Alternatives for Treating Contaminated Soil and Water. Mining Engineering, 42(6):604-608.

Letourneau, C. 1987. Transfer of Radionuclides of the Uranium and Thorium Decay Chains in Aquatic and Terrestrial Environments. Atomic Energy Control Board, Ottawa, #INFO-0237.

Letourneau, C. and J. Castonguay. 1988. Use of Biological Indicators for Evaluating Environmental Stress. Atomic Energy Control Board, Ottawa, #INFO-0248.

Little, C.A. 1980. Transuranic Elements in the Environment (Plutonium in a Grassland Ecosystem). DOE Report Doe/Tic-22800, pp420-439.

Martin, H.D., M.A. Schmitz, D.D. Walker, M.A. Ebra, and L.L. Kilpatrick. 1984. In "Ans/Et AL Waste Management 84 Conf, Tucson, Mar 11-15, 84", vol. 1, pp291-294.

McKee, P.M., D.R. Hart, and D.L. Lush. 1988. Sensitivity to Ionizing Radiation of Organisms Other than Man - An Overview with Emphasis on Cellular and Ecosystem Level Effects. Report prepared for Environment Canada on behalf of Beak Consultants Limited, Brampton, Ontario.

Medvedev, Z.A. 1990. *The Legacy of Chernobyl*. W.W. Norton & Company, New York.

Pinder, J.E.III, and K.W. McLeod. 1988. Contaminant Transport in Agroecosystems through Retention of Soil Particles on Plant Surfaces. J. of Environmental Quality, 17:602-607.

Relyea, J.F. and D.A. Brown. 1976. Adsorption and Diffusion of Plutonium in Soil. In "Erda/Univ of Georgia Env Chemistry & Cycling Processes Sym, Augusta, Apr 28-May 1, 76", pp479-494.

Rose, K.S.B. 1992. Lower Limits of Radiosensitivity in Organisms, Excluding Man. Journal of Environmental Radioactivity, 15:113-133.

Routson, R.C., G.S. Barney, and R.M. Smith. 1984. Radionuclide Sorption on Low-Exchange Capacity Hanford Site Soils. DOE Report Rho-Sa-157 P, gov. report.

Sargent, P., and T.T. Vandergraaf. 1988. Radionuclide Migration R&D in the Canadian Nuclear Fuel Waste Management Program. Radioactive Waste Management & the Nuclear Fuel Cycle, 10(1-3):21-40.

Schell, W.R., F.G. Lowman, and R.P. Marshall. 1980. Transuranic Elements in the Environment (Geochemistry of Transuranic Elements at Bikini Atoll). DOE Report Doe/Tic-22800, pp541-577.

Sprugel, D.G. and G.E. Bartelt. 1978. Erosional Removal of Fallout Plutonium from a Large Midwestern Watershed. J of Environmental Quality, 7(2):175-177.

Snodgrass, W.J., P. McKee, J. Garnett, and L. Stieff. 1988. Interaction Between Water, Sediments and Radionuclides. Report for Atomic Energy Control Board, Ottawa, #INFO-291 by Beak Consultants Ltd.

Takagi, S. 1978. Preliminary Study on Use of Zeolite for Isolation and Removal of Long Lived Cesium in Liquid Waste from Nuclear Power Stations. J Nuclear Science & Technology-Japan, 15(3):55-63.

Thompson, J.L. 1991. Radionuclide Migration Studies at the Nevada Test Site. Radiochimica Acta, 54:149-154.

B. Remediation Technologies at Bikini Atoll Islands

Atmospheric testing of atomic bombs was carried out during the late 1940s and early 1950s at the Pacific islands of Bikini Atoll. Since then, physical clean-up of the island has been undertaken, and remediation of soils to retard plant uptake of radionuclides has been carried out. This situation is analogous to the conditions now prevailing in forestry ecosystems in the vicinity of the Chernobyl accident site. Therefore, selected references relating to the clean-up/remediation of Bikini Atoll islands are included in this section. In addition, some references deal with the levels of radiological contamination at the islands, radiological dose commitment, plant uptake of radionuclides, etc.

Alcalay, G. 1981. A Tale of Two Islands: Bikini and Enewetak. Ecologist, 11(5):222-227.

Anderson, I. 1988. Potassium Could Cover Up Bikini's Radioactivity. New Scientist, 120(1642):17.

Bradley, D. *No Place to Hide, 1946/1984*. 1983. University Press of New England, Hanover, N.H.

Colsher, C.S. 1976. Derivation of Plant-Soil Relationships for Dose Assessment on Bikini Atoll (Radiation Dose to Returning Population). Lawrence Livermore Lab, California Univ.

Colsher, C.S., W.L. Robison, and P.H. Gudiksen. 1977. Evaluation of the Radionuclide Concentrations in Soil and Plants from the 1975 Terrestrial Survey of Bikini and Eneu Islands. Lawrence Livermore Lab, California Univ.

Fish, W. 1987. Clean-Up of a Radioactive Spill: Soil Chemistry and the Lessons of Bikini Atoll. In "Proceedings of the 1987 Pacific Northwest Metals and Minerals Conference. Modern Mineral and Metal Technology, Albany, OR, 26-28 April" p33.

GAO. 1979. Enewetak Atoll-Cleaning Up Nuclear Contamination. GAO Report Psad-79-54.

Gudiksen, P.H., T.R. Crites, P.L. Carson, W.R. Hendee, and D.C. Hunt. 1976. Comparison of Gamma-Ray Exposure Rate Measurements at Bikini Atoll. In "Operational Health Physics: Proceedings of 9 Topical Symposium on Operation Health Physics, Denver, CO, 9-12 Feb" pp727-729.

Hismatsu, S. and M. Skanque. 1978. Determination of Transuranium Elements in a so-called 'Bikini Ash' Sample and in Marine Sediment Samples Collected Near Bikini Atoll. Health Physics, 35(2):301-307.

Kornicker, L.S. 1991. Myodocopid Ostracoda of Enewetak and Bikini Atolls. Smithsonian Institution Press. EPA libraries accession #158446.

Kubozoe, T. 1990. 3H Concentrations in the Upper Atmosphere over Japan Since 1964. Radiation Protection Dosimetry, 34(1-4):237-239.

Lynch, O.D.T. Jr., T.F. McCraw, V.A. Nelson, and W.E. Moore. 1975. Radiological Resurvey of Food, Soil, Air, and Groundwater at Bikini Atoll, 1972. Lab of Radiation Ecology, National Environmental Research Center, Las Vegas, Nev.

Marshall, R.P. and W.R. Schell. 1974. Distribution of Alpha Emitting Radionuclides in Sediments of Bikini Atoll Lagoon (Distribution of Nuclear Weapon Parent Fissile Materials in Environment 16 Years Post-Explosion). Lab of Radiation Ecology, Washington Univ., Seattle.

Mo, T. and F.G. Lowman. 1975. Laboratory Experiments on the Transfer of Plutonium from Marine Sediments to Seawater and to Marine Organisms. Presented at Erda/Ecological Society of America 4th Natl Sym on Radioecology, Ore, May 12-14, 75, pp86-95.

Nevissi, A., and W.R. Schell. 1974. Polonium-210 and Plutonium-239,240 in Biological Samples of Bikini and Eniwetok Atoll Waters. Lab of Radiation Ecology, Washington Univ, Seattle.

Nevissi, A. and W.R. Schell. 1975. Distribution of Plutonium and Americium in Bikini Atoll Lagoon. Health Physics, 28(5):539-547.

Nevissi, A., W.R. Schell, and V.A. Nelson. 1976. Plutonium and Americium in Soils of Bikini Atoll. In "Symposium on Transuranium Nuclides in the Environment, San Fransisco, CA, 17-21 Nov 1975" pp691-700.

Noshkin, V.E., K.M. Wong, R.J Eagle, T.A. Jokela, J.A. Brunk. 1988. Radionuclide Concentrations in Fish and Invertebrates from Bikini Atoll. Lawrence Livermore National Lab, CA.

Noshkin, V.E., W.E. Robison, K.M. Wong, and R.J. Eagle. 1977. Evaluation of the Radiological Quality of the Water on Bikini and Eneu Islands in 1975: Dose Assessment Based on Initial Sampling. Lawrence Livermore Lab, California U.

Noshkin, V.E., K.M. Wong, R.J. Eagle, and G. Brown. 1975. Preliminary Evaluation of the Radiological Quality of the Water on Bikini and Eneu Islands. Lawrence Livermore Lab, California U.

Noshkin, V.E., K.M. Wong, R.J. Eagle, and C. Gatrousis. 1974.Transuranics at Pacific Atolls: I. Concentrations in the Waters at Eniwetak and Bikini. NTIS Report Ucrl-51612.

Quigley, E. 1984. Swimming in the Atomic Lagoon. Washington Monthly, 16(11):34-42.

Robison, W.L. 1988. Radiological Conditions at Bikini Atoll: Radionuclide Concentrations in Vegetation, Soil, Animals, Cistern Water, and Ground Water. Lawrence Livermore National Library, U of California. EPA libraries accession #122789.

Robison, W.L., M.E. Mount, W.A. Phillips, M.L. Stuart, S.E. Thompson, C.L. Conrado, and A.C. Stoker. 1982. Updated Radiological Dose Assessment of Bikini and Eneu Islands at Bikini Atoll. Lawrence Livermore National Lab, CA.

Schell, W.R. 1974. Concentrations and Physical-Chemical States of Radionuclides in Bikini Atoll Lagoon Water. Lab of Radiation Ecology, Washington Univ, Seattle.

Schell, W.R., A. Nevissi, and J.M. Meyers. 1978. Biogeochemistry of Transuranic Elements in Bikini Atoll Lagoon, Final Report. Lab of Radiation Ecology, Washington U, Seattle 005042131 681600. Department of Energy, Washington, D.C., Rept. RLO-T18-22 Cont. AT06-76EV70018 (microfiche only).

Shingleton, K.L., J.L. Cate, M.G. Trent, and W.L. Robison. 1988. Bikini Atoll Ionizing Radiation Survey - May 1985-May 1986. In "Radiation Protection Practice, 7 International Congress of the International Radiation Protection Association, Sydney, 10-17 Apr" vol. 3, pp1370-1373. Also, Lawrence Livermore National Lab, CA.

Shinn, J.H., D.N. Homan, and W.L. Robison. 1980. Resuspension Studies at Bikini Atoll (Pulmonary Exposure from Dust-Borne Plutonium Aerosols). Lawrence Livermore Lab, California Univ.

Smith, A.E. and W.E. Moore. 1972. Report of the Radiological Clean-Up of Bikini Atoll. Western Environmental Research Lab, Las Vegas, Nev. EPA libraries accession #102423.

Spicuzza, W. 1982. National Policy Implications of Storing Nuclear Waste in the Pacific Ocean. US Natl Security Affairs Report 82-1.

Trumbull, R. 1982. An Island People Still Exiled by Nuclear Age. US News & World Report, 93(16):48-50.

U.S. Army Corps of Engineers. 1975. Environmental Assessment for Initial Resettlement of Eneu Island, Bikini Atoll. Prepared by Environmental Resources Section, U.S. Army Corps of Engineers, Pacific Ocean Division, Fort Shaftner, Hawaii. Can be obtained from BARC, Berkeley, CA (1203 Stattuck Ave., Berkeley 94709)